

SKYROCKET



Turbo-Jet and Liquid-Rocket Power In Douglas Trans-Sonic Research Aircraft

SOON after the Douglas Aircraft Company started construction of the Skystreak, or D-558, high-speed research aircraft (now holder of the world's air speed record at 650.6 m.p.h.) the advantages to be derived in the trans-sonic speed range from swept-back wings began to be realised. The original contract was therefore extended to include the investigation of wings of this form and, since full realisation of the advantages of sweep-back could not be obtained using even the largest turbo-jet available in America, it was found necessary to build an aircraft having a supplementary rocket power plant. The new project was given the U.S. Navy designation D-558-2 and in the Douglas El Segundo factory, where it was developed in co-operation with the N.A.C.A. and U.S. Navy, it became known as the Skyrocket.

In a recent paper, Mr. E. H. Heinemann, chief engineer of the Douglas Aircraft Company, recalled that the need for a trans-sonic research aircraft was apparent as early as summer, 1945 and it was, in fact, on VJ-Day during a conference that studies of such a project were requested. The conference, incidentally, was continued at the El Segundo plant during the three-day VJ holiday.

Conventional Co-ordinates

Though the wing and tail surfaces of the Skyrocket are swept-back, the aerofoil sections are of conventional subsonic type, i.e., they have rounded leading edges and contours and are not of the pointed subsonic type. This is because the Skyrocket has been built to determine the limits of this type of the subsonic aerofoil which, of course, permits retention of relatively normal low-speed characteristics.

A Westinghouse 24C (J-34) turbo-jet is provided for take-off, normal flying and landing, the rocket motors being intended solely for high-speed test flying. Mr.

Heinemann states that considerable thought was given to the omission of the turbo-jet and to the use of a "mother ship" to carry the Skyrocket to a high launching altitude. It was, however, considered preferable, in order to develop low-speed flying qualities, to retain the turbo-jet, even though this meant a slightly lower maximum speed. The rocket motors have been built by Reaction Motors Inc.

Obviously, extreme care had to be taken in the arrangement of the power plants and fuel systems to distribute fuel uniformly about the c.g. Exhaust outlets were also arranged to react through the c.g. in order to exert a minimum effect on trim. There is tankage for

Below, the artist has visualised the nose section of the Skyrocket's fuselage, which, having been jettisoned in an emergency, nears the earth, with the pilot ejecting himself for the final parachute descent.

